Report Title

"Basin Analysis and Petroleum System Characterization and Modeling, Interior Salt Basins, Central and Eastern Gulf of Mexico"

Type of Report

First Quarterly Progress Report for Year 1

Reporting Period Start Date

May 1, 2003

Reporting Period End Date

July 31, 2003

Principal Author

Ernest A. Mancini (205/348-4319)
Department of Geological Sciences
Box 870338
202 Bevill Building
University of Alabama
Tuscaloosa, AL 35487-0338

Date Report was Issued

August 25, 2003 (Revised September 11, 2003)

DOE Award Number

DE-FC26-03NT15395

Name and Address of Participants

Ernest A. Mancini
Dept. of Geological Sciences
Box 870338
Tuscaloosa, AL 35487-0338

Donald A. Goddard
Center for Energy Studies
Louisiana State University
Baton Rouge, LA 70803

Disclaimer

Abstract

The principal research effort for Year 1 of the project is data compilation and the determination of the tectonic and depositional histories of the North Louisiana Salt Basin. In the first three (3) to six (6) months of Year 1, the research focus is on data compilation and the remainder of the year the emphasis is on the tectonic and depositional histories of the basin. No major problems have been encountered to date, and the project is on schedule.

TABLE OF CONTENTS

"Basin Analysis and Petroleum System Characterization and Modeling, Interior Salt Basins, Central and Eastern Gulf of Mexico"

First Quarter Report for Year 1
May 1, 2003—July 31, 2003

Introduction

The University of Alabama and Louisiana State University have undertaken a cooperative 5-year, fundamental research project involving sedimentary basin analysis and petroleum system characterization and modeling of the North Louisiana Salt Basin and Mississippi Interior Salt Basin. According to the USGS, the hydrocarbon volume of these basins ranks them in the top 8% of the most petroliferous basins of the world.

Executive Summary

The principal research effort for Year 1 of the project is data compilation and the determination of the tectonic and depositional histories of the North Louisiana Salt Basin. In the first three (3) to six (6) months of Year 1, the research focus is on data compilation and the remainder of the year the emphasis is on the tectonic and depositional histories of the basin.

Project Objectives

The principal objectives of the project are to develop through basin analysis and modeling the concept that petroleum systems acting in a basin can be identified through basin modeling and to demonstrate that the information and analysis resulting from characterizing and modeling of these petroleum systems in the North Louisiana Salt Basin and the Mississippi Interior Salt Basin can be used in providing a more reliable and advanced approach for targeting stratigraphic traps and specific reservoir facies within a geologic system and in providing a refined assessment of undiscovered and underdeveloped reservoirs and associated oil and gas resources.

Experimental

Work Accomplished

Data Compilation—The existing information on the North Louisiana Salt Basin is being evaluated and an electronic database of these data is under construction. The licenses to use Platte River software, Basinmod ID®, BasinView® and BasinFlow® have been renewed. The basin modeler on the project has been learning this software. The Research Team met in Baton Rouge on the LSU campus this quarter to discuss the project plan for Year 1. During this meeting the researchers identified 10 lines for cross sections, including 141 oil and gas wells, which will form the regional grid for the study of the North Louisiana Salt Basin. The majority of the well logs have been ordered from Geological Consulting Services and plans have been made for digitization of the well logs upon arrival. The remaining well logs will be ordered from another service company. Discussions have taken place with companies operating in the North Louisiana Salt Basin about the

acquisition of selective seismic profiles. Cores in the basin penetrating Jurassic strata have been located and are being described and sampled.

Work Planned

Data Compilation—Digitization of the well logs and core description and sampling will continue and these data will be entered into the electronic database.

Tectonic History—The cross sections, well logs, core and sample data, and available seismic profiles, in conjunction with the literature, will be used to interpret the tectonic history of the North Louisiana Salt Basin.

Depositional History—The cross sections, well logs, core and sample data, and available seismic profiles, in conjunction with the literature, will be used to interpret the depositional history of the North Louisiana Salt Basin.

Results and Discussion

No major problems have been encountered at this point. We are working with companies operating in the basin to acquire selective seismic profiles in this study.

Conclusions

The project work is on schedule.

References

Evans, R., 1987, Pathways of migration of oil and gas in the South Mississippi salt basin: GCAGS Transactions, v. 37, p. 75-86.

Mancini, E.A., Parcell, W.C., and Puckett, T.M., 1999, Modeling of the burial and thermal histories of strata in the Mississippi Interior Salt Basin: GCAGS Transactions, v. 49, p. 332-341.

Mancini, E.A., Parcell, W.C., Puckett, T.M., and Llinas, J.C., 2001, Topical Report 4, Basin and petroleum migration modeling of the Mississippi Interior Salt Basin, DOE Report, 46 p.

Mancini, E.A., and Puckett, T.M., 2002, Transgressive-regressive cycles: application to petroleum exploration for hydrocarbons associated with Cretaceous shelf carbonates and coastal and fluvial-deltaic siliciclastics, northeastern Gulf of Mexico, Sequence Stratigraphic Models for Exploration and Production: GCS-SEPM Foundation, p. 173-199.

Mancini, E.A., Puckett, T.M., Parcell, W.C., Llinas, J.C., Kopaska-Merkel, D.C., and Townsend, R.N., 2002, Basin analysis of the Mississippi Interior Salt Basin and petroleum system modeling of the Jurassic Smackover Formation, eastern Gulf Coastal Plain, DOE Report, DE-FG22-96BC14946, 487 p.

Nunn, J.A., 1984, Subsidence histories for the Jurassic sediments of the northern Gulf Coast: thermal-mechanical model, Jurassic of the Gulf Rim: GCS-SEPM Foundation, p. 309-322.

Pilger, R.H., 1981, The opening of the Gulf of Mexico: implications for the tectonic evolution of the northern Gulf Coast: GCAGS Transactions, v. 31, p. 377-381.

Puckett, T.M., Bearden, B.L., Mancini, E.A., and Panetta, B.J., 2000, Topical Report 3, Petroleum plays and underdeveloped reservoirs in the Mississippi Interior Salt Basin, DOE Report, 105 p.

Waples, D.W., 1994, Modeling of sedimentary basins and petroleum systems, Petroleum System—from Source to Trap: AAPG Memoir 60, p. 307-322.

Zimmerman, R.K., 1998, Chronology of oil generation in Louisiana's fractured Austin Chalk deep horizontal drilling trend: GCAGS Transactions, v. 48, p. 517-525.

Zimmerman, R.K., 1999, Potential oil generation capacity of the north Louisiana hydrocarbon system: GCAGS Transactions, v. 49, p. 532-540.

Zimmerman, R.K., and Sassen, R., 1993, Hydrocarbon transfer pathways from Smackover source rocks to younger reservoir traps in the Monroe Gas Field, Northeast Louisiana: GCAGS Transactions, v. 43, p. 473-480.

Zimmerman, R.K., and Shi, Y., 1996, Simulation and modeling of the hydrocarbon generation migration-mixing processes in Louisiana sedimentary basins: GCAGS Transactions, v. 46, p. 485.

Table 1
Milestone Chart – Year 1

	M	J	J	A	S	O	N	D	J	F	M	A
Data Compilation	xxxxxxxxxx											
Tectonic History												
Depositional History												

Work Planned
Work Accomplished xx